MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017/2018

BFN3144 – FINANCIAL DERIVATIVES

(All sections / Groups)

23 OCTOBER 2017
9.00 A.M. -11.00 A.M.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **4** pages. There are a total of **4** questions.
2. Answer **ALL** questions.
3. Marks are shown at the end of each question.

Answer all questions in the answer booklet provided.

QUESTION 1 (25 marks)

(a) You are given with the following information:

Today's Date	23rd June 2017
3-month KLIBOR (spot)	7% p.a. (90 days till 24 September 2017)
6-month KLIBOR (spot)	8% p.a. (180 days till 23rd December 2017)

September 3-month KLIBOR futures is now quoted at 92.50

Calculate the implied forward rate (IFR) for the 3-month period from September to December. (6 marks)

Is there any arbitrage opportunity in the above situation? If there is, show the arbitrage strategy (8 marks)

(b) Briefly explain two ways in which the interest rate futures contracts can be used for hedging. (6 marks)

(c) Explain what is meant by a tick. Show what makes 1 tick of the 3-month KLIBOR futures equivalent to RM25. (5 marks)

QUESTION 2 (25 marks)

You are a fund manager at MMU Asset Management Bhd. The fund you are managing tracks the performance of the Kuala Lumpur Composite Index (KLCI) with beta of 1.0. You have formed a portfolio of stocks when the KLCI stood at 1,600 points. Since then the KLCI has been very stable around that level. With current equity market sentiments, you expect the Malaysian stock market to be stable over the next two to three months. You would like to use options to enhance the value of your portfolio so that your fund will perform better than the market although the market is being very stable. The following KLCI options are available:

October 1,200 points KLCI Call options @ 70 points
October 1,600 points KLCI Call options @ 60 points
October 1,800 points KLCI Call options @ 50 points
October 1,200 points KLCI Put options @ 40 points
October 1,600 points KLCI Put options @ 50 points
October 1,800 points KLCI Put options @ 70 points

Discuss the best strategy to enhance the value of your portfolio under current market outlook. Fill in the payoff table below and draw the payoff diagram. Label the maximum, minimum and break-even points.

Continued...

S_T	Position in underlying asset	Option position			Net Profit (In points)
		Payoff	Premium	Profit	
1100					
1200					
1300					
1400					
1500					
1600					
1700					
1800					
1900					
2000					

(25 marks)

QUESTION 3 (25 marks)

(a) Under the Black Scholes option pricing model, what is the most significant criticism? (5 marks)

(b) The current stock price is selling for RM45 with its strike price of RM 40. The riskless interest rate is 5% per year and the stock price can go up and down by 10% with equal probability. Price changes twice per year and use 2-period binomial option pricing model to solve the following questions.

(i) Calculate the possible put price at maturity. (5 marks)

(ii) Calculate the possible stock prices at the end of first period. (5 marks)

(iii)Determine the current price of the put. (5 marks)

(iv)Draw the two-period binomial stock price path. (5 marks)

Continued...

QUESTION 4 (25 marks)

(a) Mizi Berhad and Yanki Berhad plan to borrow RM35 million for a 4-year loan.

Mizi Berhad is given the following quote:

4-year fixed rate @ 8%
Floating rate @ 3-month KLIBOR +1.25%

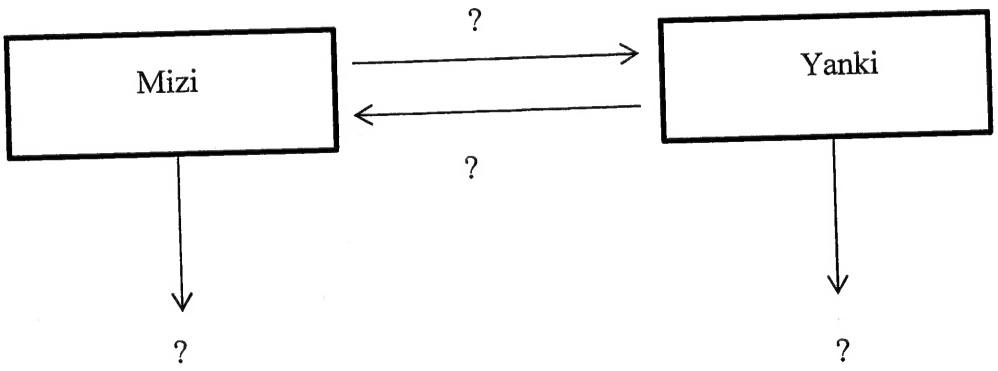
Yanki Berhad, which is a less-established company, is offered the quote below.

4-year fixed rate @ 9%
Floating rate @ 3-month KLIBOR +1.75%

(i) From your point of view, explain why Mizi Berhad can access to a lower rate of loan. (5 marks)

(ii) Calculate the 'mispricing' if any. (5 marks)

(iii) Given the comparative advantage that they have, Mizi will borrow at the fixed rate while Yanki will borrow at floating rate. Arrange an interest rate swap between them. Assume no swap bank and both parties share the cost savings equally, show the swap transaction in the diagram below. (6 marks)



(iv) Calculate the cost for each party after the swap. (5 marks)

(b) Explain forward rate agreement. (4 marks)

End of Page

Table: Cumulative Normal Distribution

d	N(d)	d	N(d)	d	N(d)	d	N(d)	d	N(d)	d	N(d)
-3.00	.0013	-1.58	.0571	-0.76	.2236	0.06	.5239	0.86	.8051	1.66	.9515
-2.95	.0016	-1.56	.0594	-0.74	.2297	0.08	.5319	0.88	.8106	1.68	.9535
-2.90	.0019	-1.54	.0618	-0.72	.2358	0.10	.5398	0.90	.8159	1.70	.9554
-2.85	.0022	-1.52	.0643	-0.70	.2420	0.12	.5478	0.92	.8212	1.72	.9573
-2.80	.0026	-1.50	.0668	-0.68	.2483	0.14	.5557	0.94	.8264	1.74	.9591
-2.75	.0030	-1.48	.0694	-0.66	.2546	0.16	.5636	0.96	.8315	1.76	.9608
-2.70	.0035	-1.46	.0721	-0.64	.2611	0.18	.5714	0.98	.8365	1.78	.9625
-2.65	.0040	-1.44	.0749	-0.62	.2676	0.20	.5793	1.00	.8414	1.80	.9641
-2.60	.0047	-1.42	.0778	-0.60	.2743	0.22	.5871	1.02	.8461	1.82	.9656
-2.55	.0054	-1.40	.0808	-0.58	.2810	0.24	.5948	1.04	.8508	1.84	.9671
-2.50	.0062	-1.38	.0838	-0.56	.2877	0.26	.6026	1.06	.8554	1.86	.9686
-2.45	.0071	-1.36	.0869	-0.54	.2946	0.28	.6103	1.08	.8599	1.88	.9699
-2.40	.0082	-1.34	.0901	-0.52	.3015	0.30	.6179	1.10	.8643	1.90	.9713
-2.35	.0094	-1.32	.0934	-0.50	.3085	0.32	.6255	1.12	.8686	1.92	.9726
-2.30	.0107	-1.30	.0968	-0.48	.3156	0.34	.6331	1.14	.8729	1.94	.9738
-2.25	.0122	-1.28	.1003	-0.46	.3228	0.36	.6406	1.16	.8770	1.96	.9750
-2.20	.0139	-1.26	.1038	-0.44	.3300	0.38	.6480	1.18	.8810	1.98	.9761
-2.15	.0158	-1.24	.1075	-0.42	.3373	0.40	.6554	1.20	.8849	2.00	.9772
-2.10	.0179	-1.22	.1112	-0.40	.3446	0.42	.6628	1.22	.8888	2.05	.9798
-2.05	.0202	-1.20	.1151	-0.38	.3520	0.44	.6700	1.24	.8925	2.10	.9821
-2.00	.0228	-1.18	.1190	-0.36	.3594	0.46	.6773	1.26	.8962	2.15	.9842
-1.98	.0239	-1.16	.1230	-0.34	.3669	0.48	.6844	1.28	.8997	2.20	.9861
-1.96	.0250	-1.14	.1271	-0.32	.3745	0.50	.6915	1.30	.9032	2.25	.9878
-1.94	.0262	-1.12	.1314	-0.30	.3821	0.52	.6985	1.32	.9066	2.30	.9893
-1.92	.0274	-1.10	.1357	-0.28	.3897	0.54	.7054	1.34	.9099	2.35	.9906
-1.90	.0287	-1.08	.1401	-0.26	.3974	0.56	.7123	1.36	.9131	2.40	.9918
-1.88	.0301	-1.06	.1446	-0.24	.4052	0.58	.7191	1.38	.9162	2.45	.9929
-1.86	.0314	-1.04	.1492	-0.22	.4129	0.60	.7258	1.40	.9192	2.50	.9938
-1.84	.0329	-1.02	.1539	-0.20	.4207	0.62	.7324	1.42	.9222	2.55	.9946
-1.82	.0344	-1.00	.1587	-0.18	.4286	0.64	.7389	1.44	.9251	2.60	.9953
-1.80	.0359	-0.98	.1635	-0.16	.4365	0.66	.7454	1.46	.9279	2.65	.9960
-1.78	.0375	-0.96	.1685	-0.14	.4443	0.68	.7518	1.48	.9306	2.70	.9965
-1.76	.0392	-0.94	.1736	-0.12	.4523	0.70	.7580	1.50	.9332	2.75	.9970
-1.74	.0409	-0.92	.1788	-0.10	.4602	0.72	.7642	1.52	.9357	2.80	.9974
-1.72	.0427	-0.90	.1841	-0.08	.4681	0.74	.7704	1.54	.9382	2.85	.9978
-1.70	.0446	-0.88	.1894	-0.06	.4761	0.76	.7764	1.56	.9406	2.90	.9981
-1.68	.0465	-0.86	.1949	-0.04	.4841	0.78	.7823	1.58	.9429	2.95	.9984
-1.66	.0485	-0.84	.2005	-0.02	.4920	0.80	.7882	1.60	.9452	3.00	.9986
-1.64	.0505	-0.82	.2061	0.00	.5000	0.82	.7939	1.62	.9474	3.05	.9989
-1.62	.0526	-0.80	.2119	0.02	.5080	0.84	.7996	1.64	.9495		
-1.60	.0548	-0.78	.2177	0.04	.5160						

This table shows the probability [N(d)] of observing a value less than or equal to *d*. For example, as illustrated, if *d* is -.24, then N(d) is .4052.